FINAL REPORT

PRAIRIE AQUACULTURE RESEARCH FACILITY
RENOVATION PROJECT

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Prepared by: University of Saskatchewan

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FINAL REPORT

on:

PRAIRIE AQUACULTURE RESEARCH FACILITY DEVELOPMENT PROJECT

Prepared for:

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Submitted to:

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Research and Development Infrastructure Program
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I. Project Objectives

The object of the project was to encourage the development of value-added and alternative agricultural ingredients from the Canadian Prairies for the aquacultural industry by creating a research facility to focus on the development of aquaculture feed ingredients from prairie products. The facility was successfully constructed and is now fully operational.

II. Progress to Date

A. Research Site

The Saskatchewan Research Council's (SRC) Aquaculture Research Station was initially investigated as a location for future research. The facility was developed in 1984 to investigate ecological approaches to water treatment (Bioredediation). However, the Department of Animal and Poultry Science at the University of Saskatchewan provided a research space in the Livestock Research Building (LRB) on campus. The research space was designed for the study of livestock and is fitted with floor drains, a water supply, and a private entrance. The room is located at the end of LRB, which ensures segregation of fish research with other animals studies.

B. Experimental system

The experimental systems contains 30 tanks (60 gallons/tank). A Culligan activated carbon filter is used to remove chlorine and chloramine prior to entering the system. Water is delivered to culture tanks by a centrifugal water pump (40 GPM). Water drains from tanks through a bottom drain. Water level is maintained by an external stand pipe. Water leaves tanks An auxiliary heaters/chillers unit is successfully controlling water temperature to meet research requirements. Filtration occurs through a solids and nitrofication bead filter and a UV filter.

1. Use of system for feeding trials

The system has presently been used for six research trials. For each study, rainbow trout were purchased through Keet's Fish Farm (Vanscoy, SK and quarantined in a single large tank (500 gallons) for two weeks and observed for the outbreak of disease. Fish were then selected from this population and counted into research tanks. Results from studies will be published at a later date. Four studies were conducted by Debbie Thiessen, a graduate student at the U of S. These studies involved the used of "thin distiller's solubles for use in palatability enhancement of feeds that contained high levels of prairie plant sources. Two additional trials were completed by Saskatchewan Wheat Pool regarding the use of experimental canola products. The results for the digestibility portion of this study are attached in the appendix.

2. Use of System for Apparent Digestibility Determinations

Fish digestibility chambers have been installed on twelve of the research tanks, which were used for feed digestibility analysis. The collectors were designed after the Guelph Fecal Collection System, where feces is trapped and removed from the system for analysis.

Test Ingredient	DRY MATTER DIGESTIBILITY COEFFICIENTS (%)	
	University of Saskatchewan	University of Guelph
Canola Meal	51[C]	35
Canola Meal – High Pro	58[C]	-
Canola Meal – High Fat, Low Cook	72[B]	-
Soybean Meal	78[B]	74
Chilean Anchovy Meal	95[A]	85

PROTEIN DIGESTIBLITY COEFFICIENTS (%)

Test Ingredient	University of Saskatchewan	University of Guelph	Higgs et al., 1995	Prairie Swine Centre (Apparent Ileal Dig. Protein)
Canola Meal	87[C]	77 (Rape)	83.2-87.1	63.9[C]
Canola Meal – High Pro	90[C]	-	92.9 (Dehulled 00)	69.4[B]
Canola Meal – High Fat, Low Cook	93[B]	-	92.9 (Dehulled 00)	72.7[A]
Soybean Meal	99[A]	96	-	-
Chilean Anchovy Meal	96[AB]	92	-	-

ENERGY DIGESTIBLITY COEFFICIENTS (%)

Test Ingredient	University of Saskatchewan	University of Guelph	Higgs et al., 1995	Prairie Swine Centre (Apparent Ileal Dig. Protein)
Canola Meal	54[C]	45 (Rape)	72.4 - 75.4	82.3[C]
Canola Meal – High Pro	67[C]	-	82.7 (Dehulled 00)	90.5[B]
Canola Meal – High Fat, Low Cook	80[B]	-	82.7 (Dehulled 00)	87.7[A]
Soybean Meal	83[A]	75	-	-
Chilean Anchovy Meal	98[AB]	92	-	-

DIGESTIBLE ENERGY (MJ/kg)

Test Ingredient	University of Saskatchewan	University of Guelph	Higgs et al., 1995	Prairie Swine Centre (Apparent Ileal Dig. Protein)
Canola Meal	8.1	8.1 (Rape)	11.9 - 13 (Salmo salar)	13.5
Canola Meal – High Pro	10.6	-	-	16.4
Canola Meal – High Fat, Low Cook	17.7	-	-	19.8
Soybean Meal	13.6	13.5	-	-
Chilean Anchovy Meal	19.3	18.8	-	-